

APPLICATION NO. 09/787526

February 7, 2005

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1. (Currently Amended) A semiconductor device comprising:
a semiconductor substrate formed with pads;
a passivation film formed on a surface of said semiconductor substrate on a pad forming side; and
lands for connection to external terminals, said lands being formed on an insulating film formed on a surface of said passivation film opposite to said semiconductor substrate,
wherein:
said pads and said lands are connected by conductive wiring lines; and
said external terminals are solder bumps and said lands are formed of a material comprising Cu; and
projections, made of a material comprising Cu, are formed on each of said lands at positions where said lands are connected to the external terminals.

2. (Currently Amended) A semiconductor device comprising:
a silicon substrate formed with pads;
a passivation film formed on a surface of said silicon substrate on a pad forming side;
lands for connection to external terminals which are solder bumps, said lands being made of a material comprised of Cu and formed on the surface of said silicon substrate on the pad forming side, respectively; and

CLAIMS 3-4 (CANCELLED)

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5. (Currently Amended) A semiconductor device comprising:
a semiconductor substrate formed with pads;
a passivation film formed on a surface of said semiconductor substrate on a pad forming side;
lands for connection to external terminals, said lands being formed on the surface of said semiconductor substrate on the pad forming side,
wherein said external terminals are solder bumps and said lands are formed of a material comprising Cu;
the external terminals being connected to said lands,
wherein said projections, made of a material comprising Cu, are formed on said lands at positions where said lands are connected to the external terminals, respectively; and
wiring lines connecting said pads and said lands,
wherein an insulating protective film is formed on the surface of said semiconductor substrate on the pad forming side in an area other than the external terminals.

CLAIMS 6-10 (CANCELLED)

11. (Previously Presented) A semiconductor device according to any one of claims 1 to 10, wherein in a semiconductor module having the semiconductor device mounted on a printed circuit board via the external terminals, a bonding area between a bonding pad of the printed circuit board and one of the external terminals is set larger than a bonding area between one of the projections and said one of the external terminals in a direction of disposing the external terminals.

12. (Previously Presented) A semiconductor device according to any one of claims 1 to 10, wherein in a semiconductor module having the semiconductor device mounted on a printed circuit board via the external terminals, an area near a bonding area between a bonding pad of the printed circuit board and one of the external terminals is covered with resin.

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13. (Previously Presented) A semiconductor device according to claim 1 or 2, wherein said projections each include a first portion which extends into a corresponding one of said external terminals and a second portions located between a corresponding one of said lands and said first portion.

14. (Previously Presented) A semiconductor device according to claim 13, wherein each of said first portions of said projections has substantially the same width as a corresponding one of said second portions of said projections.

CLAIMS 15-16 (CANCELLED)

17. (New) A semiconductor device according to claim 1, wherein the projections are positioned in projected areas of said lands.

18. (New) A semiconductor device according to claim 2, wherein the projections are positioned in projected areas of said lands.

19. (New) A semiconductor device according to claim 1, wherein the external terminals and the projections are respectively each bonded via a metal thin film formed on a surface of the projection.

20. (New) A semiconductor device according to claim 2, wherein the external terminals and the projections are respectively each bonded via a metal thin film formed on a surface of the projection.

21. (New) A semiconductor device according to claim 1,
wherein a protective film having an opening in a region in which said land is disposed is formed on said conductive wiring and a portion of said projection is projected from a surface of said protective film.

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